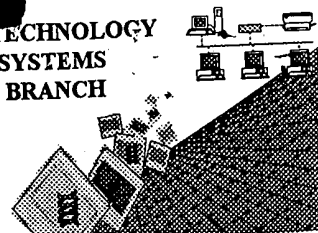


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PATENT APPLICATION: US/09/718,355C

DATE: 01/06/2003

TIME: 10:30:19

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Output Set: N:\CRF4\01062003\I718355C.raw

3 <110> APPLICANT: Rouleau, Guy A.
 4 Lafreniere, Ronald G.
 5 Rochefort, Daniel
 7 <120> TITLE OF INVENTION: LOCI FOR IDIOPATHIC GENERALIZED EPILEPSY, MUTATIONS
 8 THEREOF AND METHOD USING SAME TO ASSESS, DIAGNOSE,
 9 PROGNOSIS OR TREAT EPILEPSY
 11 <130> FILE REFERENCE: GOUD:023US
 13 <140> CURRENT APPLICATION NUMBER: 09/718,355C
 14 <141> CURRENT FILING DATE: 2000-11-24
 16 <150> PRIOR APPLICATION NUMBER: PCT/CA00/01404
 17 <151> PRIOR FILING DATE: 2000-11-24
 19 <150> PRIOR APPLICATION NUMBER: 60/167,623
 20 <151> PRIOR FILING DATE: 1999-11-26
 22 <160> NUMBER OF SEQ ID NOS: 408
 24 <170> SOFTWARE: PatentIn Ver. 2.1

ERRORED SEQUENCES

Isandkeas found throughout seq. listing. - feature required
See p. 15 for explanation

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 1428 <211> LENGTH: 516
 1429 <212> TYPE: DNA
 1430 <213> ORGANISM: Homo sapiens
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 1434 ccccttattc aatctctctt tttctctaaa aatatctcta cctcaagaag aataaaaaac 120
 1435 aaattcatag taataatcct tcttggcagg caacttatta ccaaaattaa ggactttact 180
 1436 ttctatgtcc atctcactta cagaaactga atgaaagcag tagctcatca gaaggtagca 240
 1437 ctgtggacat cggcgcacct gtagaagaac agcccgtagt ggaacctgaa gaaactcttg 300
 1438 aacccgaagc ttgtttcact gaaggtaaag aaaagaatcc taatgttaat ctttcatttg 360
 E--> 1439 gagtgcagct tatttagctg ttggtcagct aanataaatc acatataata aaatngcact 420
 E--> 1440 ttgtaataga tataattcaa tcacctctaa tatnttgaca gacaaaaaaa cttaaagtct 480
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 1540 tggtaggtgg aactccagcc taagtatgaa gaaagtctgt acatgtatct ttactttggt 180
 1541 attttcatca tctttgggtc cttcttcacc ttgaacctgt ttattggtgt catcatagat 240
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2798 cttttgttta gaagatttca cttttttacg ggatccatgg aattggttgg atttcacagt 180
2799 cattactttt gcgtaagtat cttaatacat ttctatcct ggaagagtaa atcactggtg 240
E--> 2800 ggagcctata ctatatcttc cttggtggct tgcttgaca gaccaagcat ttntcttagt 300
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2802 aattacatgg                                     370
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E--> 2813 atgaaagacc aangaagacg tagatttccc taaattctga ataactctga ttttaattcta 180
2814 caggtatgta acagaatttg taaacctagg caatgtttca gctcttcgaa ctttcagagt 240
2815 cttgagagct ttgaaaacta tttctgtaat tccaggtaag aagaaaatgg tataaggtgg 300
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2843 tcacaaacat taaactaata ttgttggcat tctgcatgac atttttattt tccaggccaa 180
E--> 2844 gctcatgata tttttgccgg taaaatagct gttgagtagt atatttaant tcccccttct 240
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2852 agagatatca aaggatacct tattctatct tttttatctg tccattgata tagtaaaagt 720
2853 tctcatttga aaatgtgttg tcttatactc atgttgaaag taatttcata ttatgccata 780
2854 ttaaaaaagg tttatttggg agacattaat cagggttttc agtcatttta ataaataagt 840
2855 cagtagtttg aactattcmg cgtattccac tgaaatgtcg ttaagaagac tgaggggaaa 900
2856 taatttggcc ctatttgggt gatgcaacat atgtattgag tacatatgct atatctgaaa 960
2857 ctagagaaac catttatcaa gatgaaataa gaatttgtgt gctcctcaga aggttaagta 1020
2858 accctgattt agccattcac ttcatccata ttctaattag tccctt                                     1066

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E--> 2919 tgaagctcaa ttaagcagta acatgataat ttttttttaa gatnatatgc aacttcccac 180
2920 atacttttgcg cccttctagg cggcagctgc agccgcattc gctgaatcaa gagacttcag 240
2921 tgggtgctggt gggataggag ttttttcaga gagttcttca gtagcatcta agttgagctc 300
2922 caaaagttaa aaagagctga aaaacagaaag aaagaaaaag aaacagaaaag aacagtctgg 360
2923 agaagaagag aaaaatgaca ggtcctaaa atcggaatct gaagacagca taagaagaaa 420
2924 aggtttccgt ttttccttgg aaggaagtag gctgacatat gaaaagagat tttcttctcc 480
2925 acaccaggta aaaatattaa attacatgaa ttgtgttctc ataaattttt taaaagaata 540
2926 tgccagaatt taatggagag aaaaccgcct tccacctgga tggcacaatg ctttcagagt 600
2927 agtgatgatt atcaagtgtt ttggctatca cttcagagaa tttgtgagtt ttgcaacttt 660
2928 ttggaatccc aggaaggaaa ttttagatcc ctctgggttt ggaaaaattt g 711
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3061 tggcattatg tttaagttct taattacaga tcaagaaaaa tgcatacaga agatgggggg 180
3062 gggcacacct aattaatttt tatattttaga ttaagaaaaa taattaaatg tgtttttttg 240
3063 tgggattgat ttccagaagc taaatgcaac tagttcatct gaaggcagca cggttgatat 300
3064 tggagctccc gccgagggag aacagcctga ggttgaacct gaggaatccc ttgaacctga 360
E--> 3065 agcctgtttt acagaagnnn nnnnnnaagc aaaacaataa catatgtggt cttgagtatc 420
3066 ctcttttcta cccatttttt cctattttatt taaatgtctg tttatttgtc taccatctag 480
3067 ttcatctatc tatctgtatc tatctatcta tctatctatc tagtaatcat ctatacctat 540
3068 ccaacaactg tacattttatt tgtttttttt ttttgcatth gctgtttgaa aaaaaatgca 600
3069 acgtttttaa ggcaa 615
3598 <210> SEQ ID NO: 67
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3600 <212> TYPE: PRT
3601 <213> ORGANISM: Homo sapiens
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3605 1 5 10 15
3607 Phe Thr Arg Glu Ser Leu Ala Ala Ile Glu Lys Arg Ala Ala Glu Glu
3608 20 25 30
3610 Lys Ala Lys Lys Pro Lys Lys Glu Gln Asp Asn Asp Asp Glu Asn Lys
3611 35 40 45
3613 Pro Lys Pro Asn Ser Asp Leu Glu Ala Gly Lys Asn Leu Pro Phe Ile
3614 50 55 60
3616 Tyr Gly Asp Ile Pro Pro Glu Met Val Ser Glu Pro Leu Glu Asp Leu
3617 65 70 75 80
3619 Asp Pro Tyr Tyr Ile Asn Lys Lys Thr Phe Ile Val Met Asn Lys Gly

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3623                               100                               105                               110
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3626                               115                               120                               125
3628 Leu Phe Ser Met Leu Ile Met Cys Thr Ile Leu Thr Asn Cys Val Phe
3629                               130                               135                               140
3631 Met Thr Leu Ser Asn Pro Pro Asp Trp Thr Lys Asn Val Glu Tyr Thr
3632 145                               150                               155                               160
3634 Phe Thr Gly Ile Tyr Thr Phe Glu Ser Leu Ile Lys Ile Leu Ala Arg
3635                               165                               170                               175
3637 Gly Phe Cys Leu Glu Asp Phe Thr Phe Leu Arg Asp Pro Trp Asn Trp
3638                               180                               185                               190
3640 Leu Asp Phe Ser Val Ile Val Met Ala Tyr Val Thr Glu Phe Val Asp
3641                               195                               200                               205
3643 Leu Gly Asn Val Ser Ala Leu Arg Thr Phe Arg Val Leu Arg Ala Leu
3644                               210                               215                               220
3646 Lys Thr Ile Ser Val Ile Pro Gly Leu Lys Thr Ile Val Gly Ala Leu
3647 225                               230                               235                               240
3649 Ile Gln Ser Val Lys Lys Leu Ser Asp Val Met Ile Leu Thr Val Phe
3650                               245                               250                               255
3652 Cys Leu Ser Val Phe Ala Leu Ile Gly Leu Gln Leu Phe Met Gly Asn
3653                               260                               265                               270
3655 Leu Arg Asn Lys Cys Leu Gln Trp Pro Pro Ser Asp Ser Ala Phe Glu
3656                               275                               280                               285
3658 Thr Asn Thr Thr Ser Tyr Phe Asn Gly Thr Met Asp Ser Asn Gly Thr
3659                               290                               295                               300
3661 Phe Val Asn Val Thr Met Ser Thr Phe Asn Trp Lys Asp Tyr Ile Gly
3662 305                               310                               315                               320
3664 Asp Asp Ser His Phe Tyr Val Leu Asp Gly Gln Lys Asp Pro Leu Leu
3665                               325                               330                               335
3667 Cys Gly Asn Gly Ser Asp Ala Gly Gln Cys Pro Glu Gly Tyr Ile Cys
3668                               340                               345                               350
3670 Val Lys Ala Gly Arg Asn Pro Asn Tyr Gly Tyr Thr Ser Phe Asp Thr
3671                               355                               360                               365
3673 Phe Ser Trp Ala Phe Leu Ser Leu Phe Arg Leu Met Thr Gln Asp Tyr
3674                               370                               375                               380
3676 Trp Glu Asn Leu Tyr Gln Leu Thr Leu Arg Ala Ala Gly Lys Thr Tyr
3677 385                               390                               395                               400
3679 Met Ile Phe Phe Val Leu Val Ile Phe Leu Gly Ser Phe Tyr Leu Val
3680                               405                               410                               415
3682 Asn Leu Ile Leu Ala Val Val Ala Met Ala Tyr Glu Gly Gln Asn Gln
3683                               420                               425                               430
3685 Ala Thr Leu Glu Glu Ala Glu Gln Lys Glu Ala Glu Phe Gln Gln Met
3686                               435                               440                               445
3688 Leu Glu Gln Leu Lys Lys Gln Gln Glu Glu Ala Gln Ala Val Ala Ala
3689                               450                               455                               460
3691 Ala Ser Ala Ala Ser Arg Asp Phe Ser Gly Ile Gly Gly Leu Gly Glu
3692 465                               470                               475                               480

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DATE: 01/06/2003

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3698                               500                               505                               510
3700 Glu Gly Asn Asn Lys Gly Glu Arg Asp Ser Phe Pro Lys Ser Glu Ser
3701                               515                               520                               525
3703 Glu Asp Ser Val Lys Arg Ser Ser Phe Leu Phe Ser Met Asp Gly Asn
3704                               530                               535                               540
3706 Arg Leu Thr Ser Asp Lys Lys Phe Cys Ser Pro His Gln Ser Leu Leu
3707 545                               550                               555                               560
3709 Ser Ile Arg Gly Ser Leu Phe Ser Pro Arg Arg Asn Ser Lys Thr Ser
3710                               565                               570                               575
3712 Ile Phe Ser Phe Arg Gly Arg Ala Lys Asp Val Gly Ser Glu Asn Asp
3713                               580                               585                               590
3715 Phe Ala Asp Asp Glu His Ser Thr Phe Glu Asp Ser Glu Ser Arg Arg
3716                               595                               600                               605
3718 Asp Ser Leu Phe Val Pro His Arg His Gly Glu Arg Arg Asn Ser Asn
3719                               610                               615                               620
3721 Gly Thr Thr Thr Glu Thr Glu Val Arg Lys Arg Arg Leu Ser Ser Tyr
3722 625                               630                               635                               640
3724 Gln Ile Ser Met Glu Met Leu Glu Asp Ser Ser Gly Arg Gln Arg Ala
3725                               645                               650                               655
3727 Val Ser Ile Ala Ser Ile Leu Thr Asn Thr Met Glu Glu Leu Glu Glu
3728                               660                               665                               670
3730 Ser Arg Gln Lys Cys Pro Pro Cys Trp Tyr Arg Phe Ala Asn Val Phe
3731                               675                               680                               685
3733 Leu Ile Trp Asp Cys Cys Asp Ala Trp Leu Lys Val Lys His Leu Val
3734                               690                               695                               700
3736 Asn Leu Ile Val Met Asp Pro Phe Val Asp Leu Ala Ile Thr Ile Cys
3737 705                               710                               715                               720
3739 Ile Val Leu Asn Thr Leu Phe Met Ala Met Glu His Tyr Pro Met Thr
3740                               725                               730                               735
3742 Glu Gln Phe Ser Ser Val Leu Thr Val Gly Asn Leu Val Phe Thr Gly
3743                               740                               745                               750
3745 Ile Phe Thr Ala Glu Met Val Leu Lys Ile Ile Ala Met Asp Pro Tyr
3746                               755                               760                               765
3748 Tyr Tyr Phe Gln Glu Gly Trp Asn Ile Phe Asp Gly Ile Ile Val Ser
3749                               770                               775                               780
3751 Leu Ser Leu Met Glu Leu Gly Leu Ser Asn Val Glu Gly Leu Ser Val
3752 785                               790                               795                               800
3754 Leu Arg Ser Phe Arg Leu Leu Arg Val Phe Lys Leu Ala Lys Ser Trp
3755                               805                               810                               815
3757 Pro Thr Leu Asn Met Leu Ile Lys Ile Ile Gly Asn Ser Val Gly Ala
3758                               820                               825                               830
3760 Leu Gly Asn Leu Thr Leu Val Leu Ala Ile Ile Val Phe Ile Phe Ala
3761                               835                               840                               845
3763 Val Val Gly Met Gln Leu Phe Gly Lys Ser Tyr Lys Glu Cys Val Cys
3764                               850                               855                               860
3766 Lys Ile Asn Asp Asp Cys Thr Leu Pro Arg Trp His Met Asn Asp Phe

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3773          900          905          910
3775 Ile Val Phe Met Leu Val Met Val Ile Gly Asn Leu Val Val Leu Asn
3776          915          920          925
3778 Leu Phe Leu Ala Leu Leu Leu Ser Ser Phe Ser Ser Asp Asn Leu Ala
3779          930          935          940
3781 Ala Thr Asp Asp Asp Asn Glu Met Asn Asn Leu Gln Ile Ala Val Gly
3782 945          950          955          960
3784 Arg Met Gln Lys Gly Ile Asp Tyr Val Lys Asn Lys Met Arg Glu Cys
3785          965          970          975
3787 Phe Gln Lys Ala Phe Phe Arg Lys Pro Lys Val Ile Glu Ile His Glu
3788          980          985          990
3790 Gly Asn Lys Ile Asp Ser Cys Met Ser Asn Asn Thr Gly Ile Glu Ile
3791          995          1000          1005
3793 Ser Lys Glu Leu Asn Tyr Leu Arg Asp Gly Asn Gly Thr Thr Ser Gly
3794          1010          1015          1020
3796 Val Gly Thr Gly Ser Ser Val Glu Lys Tyr Val Ile Asp Glu Asn Asp
3797 1025          1030          1035          1040
3799 Tyr Met Ser Phe Ile Asn Asn Pro Ser Leu Thr Val Thr Val Pro Ile
3800          1045          1050          1055
3802 Ala Val Gly Glu Ser Asp Phe Glu Asn Leu Asn Thr Glu Glu Phe Ser
3803          1060          1065          1070
3805 Ser Glu Ser Glu Leu Glu Glu Ser Lys Glu Lys Leu Asn Ala Thr Ser
3806          1075          1080          1085
3808 Ser Ser Glu Gly Ser Thr Val Asp Val Val Leu Pro Arg Glu Gly Glu
3809          1090          1095          1100
3811 Gln Ala Glu Thr Glu Pro Glu Glu Asp Leu Lys Pro Glu Ala Cys Phe
3812 1105          1110          1115          1120
3814 Thr Glu Gly Cys Ile Lys Lys Phe Pro Phe Cys Gln Val Ser Thr Glu
3815          1125          1130          1135
3817 Glu Gly Lys Gly Lys Ile Trp Trp Asn Leu Arg Lys Thr Cys Tyr Ser
3818          1140          1145          1150
3820 Ile Val Glu His Asn Trp Phe Glu Thr Phe Ile Val Phe Met Ile Leu
3821          1155          1160          1165
3823 Leu Ser Ser Gly Ala Leu Ala Phe Glu Asp Ile Tyr Ile Glu Gln Arg
3824          1170          1175          1180
3826 Lys Thr Ile Lys Thr Met Leu Glu Tyr Ala Asp Lys Val Phe Thr Tyr
3827 1185          1190          1195          1200
3829 Ile Phe Ile Leu Glu Met Leu Leu Lys Trp Val Ala Tyr Gly Phe Gln
3830          1205          1210          1215
3832 Thr Tyr Phe Thr Asn Ala Trp Cys Trp Leu Asp Phe Leu Ile Val Asp
3833          1220          1225          1230
3835 Val Ser Leu Val Ser Leu Val Ala Asn Ala Leu Gly Tyr Ser Glu Leu
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3838 Gly Ala Ile Lys Ser Leu Arg Thr Leu Arg Ala Leu Arg Pro Leu Arg
3839          1250          1255          1260

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3845          1285          1290          1295
3847 Trp Leu Ile Phe Ser Ile Met Gly Val Asn Leu Phe Ala Gly Lys Phe
3848          1300          1305          1310
3850 Tyr His Cys Val Asn Met Thr Thr Gly Asn Met Phe Asp Ile Ser Asp
3851          1315          1320          1325
3853 Val Asn Asn Leu Ser Asp Cys Gln Ala Leu Gly Lys Gln Ala Arg Trp
3854          1330          1335          1340
3856 Lys Asn Val Lys Val Asn Phe Asp Asn Val Gly Ala Gly Tyr Leu Ala
3857 1345          1350          1355          1360
3859 Leu Leu Gln Val Ala Thr Phe Lys Gly Trp Met Asp Ile Met Tyr Ala
3860          1365          1370          1375
3862 Ala Val Asp Ser Arg Asp Val Lys Leu Gln Pro Val Tyr Glu Glu Asn
3863          1380          1385          1390
3865 Leu Tyr Met Tyr Leu Tyr Phe Val Ile Phe Ile Ile Phe Gly Ser Phe
3866          1395          1400          1405
3868 Phe Thr Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn Gln
3869          1410          1415          1420
3871 Gln Lys Lys Lys Phe Gly Gly Gln Asp Ile Phe Met Thr Glu Glu Gln
3872 1425          1430          1435          1440
3874 Lys Lys Tyr Tyr Asn Ala Met Lys Lys Leu Gly Ser Lys Lys Pro Gln
3875          1445          1450          1455
3877 Lys Pro Ile Pro Arg Pro Ala Asn Lys Phe Gln Gly Met Val Phe Asp
3878          1460          1465          1470
3880 Phe Val Thr Arg Gln Val Phe Asp Ile Ser Ile Met Ile Leu Ile Cys
3881          1475          1480          1485
3883 Leu Asn Met Val Thr Met Met Val Glu Thr Asp Asp Gln Gly Lys Tyr
3884          1490          1495          1500
3886 Met Thr Leu Val Leu Ser Arg Ile Asn Leu Val Phe Ile Val Leu Phe
3887 1505          1510          1515          1520
3889 Thr Gly Glu Phe Val Leu Lys Leu Val Ser Leu Arg His Tyr Tyr Phe
3890          1525          1530          1535
3892 Thr Ile Gly Trp Asn Ile Phe Asp Phe Val Val Val Ile Leu Ser Ile
3893          1540          1545          1550
3895 Val Gly Met Phe Leu Ala Glu Met Ile Glu Lys Tyr Phe Val Ser Pro
3896          1555          1560          1565
3898 Thr Leu Phe Arg Val Ile Arg Leu Ala Arg Ile Gly Arg Ile Leu Arg
3899          1570          1575          1580
3901 Leu Ile Lys Gly Ala Lys Gly Ile Arg Thr Leu Leu Phe Ala Leu Met
3902 1585          1590          1595          1600
3904 Met Ser Leu Pro Ala Leu Phe Asn Ile Gly Leu Leu Leu Phe Leu Val
3905          1605          1610          1615
3907 Met Phe Ile Tyr Ala Ile Phe Gly Met Ser Asn Phe Ala Tyr Val Lys
3908          1620          1625          1630
3910 Lys Glu Ala Gly Ile Asp Asp Met Phe Asn Phe Glu Thr Phe Gly Asn
3911          1635          1640          1645
3913 Ser Met Ile Cys Leu Phe Gln Ile Thr Thr Ser Ala Gly Trp Asp Gly

```


RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/718,355C

DATE: 01/06/2003

TIME: 10:30:21

Input Set : A:\GOUD023US.APP

Output Set: N:\CRF4\01062003\I718355C.raw

```

3914      1650      1655      1660
3916 Leu Leu Ala Pro Ile Leu Asn Ser Ala Pro Pro Asp Cys Asp Pro Asp
3917 1665      1670      1675      1680
3919 Thr Ile His Pro Gly Ser Ser Val Lys Gly Asp Cys Gly Asn Pro Ser
3920      1685      1690      1695
3922 Val Gly Ile Phe Phe Phe Val Ser Tyr Ile Ile Ile Ser Phe Leu Val
3923      1700      1705      1710
3925 Val Val Asn Ser Tyr Ile Ala Val Ile Leu Glu Asn Phe Ser Val Ala
3926      1715      1720      1725
3928 Thr Glu Glu Ser Ala Glu Pro Leu Ser Glu Asp Asp Phe Glu Met Phe
3929      1730      1735      1740
3931 Tyr Glu Val Trp Glu Lys Phe Asp Pro Asp Ala Thr Gln Phe Ile Glu
3932 1745      1750      1755      1760
3934 Phe Ser Lys Leu Ser Asp Phe Ala Ala Ala Leu Asp Pro Pro Leu Leu
3935      1765      1770      1775
3937 Ile Ala Lys Pro Asn Lys Val Gln Leu Ile Ala Met Asp Leu Pro Met
3938      1780      1785      1790
3940 Val Ser Gly Asp Arg Ile His Cys Leu Asp Ile Leu Phe Ala Phe Thr
3941      1795      1800      1805
3943 Lys Arg Val Leu Gly Glu Ser Gly Glu Met Asp Ala Leu Arg Ile Gln
3944      1810      1815      1820
3946 Met Glu Asp Arg Phe Met Ala Ser Asn Pro Ser Lys Val Ser Tyr Glu
3947 1825      1830      1835      1840
3949 Pro Ile Thr Thr Thr Leu Lys Arg Lys Gln Glu Glu Val Ser Ala Ala
3950      1845      1850      1855
3952 Ile Ile Gln Arg Asn Phe Arg Cys Tyr Leu Leu Lys Gln Arg Leu Lys
3953      1860      1865      1870
3955 Asn Ile Ser Ser Asn Tyr Asn Lys Glu Ala Ile Lys Gly Arg Ile Asp
3956      1875      1880      1885
3958 Leu Pro Ile Lys Gln Asp Met Ile Ile Asp Lys Leu Asn Gly Asn Ser
3959      1890      1895      1900
3961 Thr Pro Glu Lys Thr Asp Gly Ser Ser Ser Thr Thr Ser Pro Pro Ser
3962 1905      1910      1915      1920
3964 Tyr Asp Ser Val Thr Lys Pro Asp Lys Glu Lys Phe Glu Lys Asp Lys
3965      1925      1930      1935
3967 Pro Glu Lys Glu Ser Lys Gly Lys Glu Val Arg Glu Asn Gln Lys
3968      1940      1945      1950
3971 <210> SEQ ID NO: 68
3972 <211> LENGTH: 1951
3973 <212> TYPE: PRT
3974 <213> ORGANISM: Homo sapiens
3976 <400> SEQUENCE: 68
3977 Met Ala Gln Ala Leu Leu Val Pro Pro Gly Pro Glu Ser Phe Arg Leu
3978      1      5      10      15
3980 Phe Thr Arg Glu Ser Leu Ala Ala Ile Glu Lys Arg Ala Ala Glu Glu
3981      20      25      30
3983 Lys Ala Lys Lys Pro Lys Lys Glu Gln Asp Asn Asp Asp Glu Asn Lys
3984      35      40      45
3986 Pro Lys Pro Asn Ser Asp Leu Glu Ala Gly Lys Asn Leu Pro Phe Ile

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/718,355C

DATE: 01/06/2003

TIME: 10:30:21

Input Set : A:\GOUD023US.APP

Output Set: N:\CRF4\01062003\I718355C.raw

```

3987      50      55      60
3989 Tyr Gly Asp Ile Pro Pro Glu Met Val Ser Glu Pro Leu Glu Asp Leu
3990 65      70      75      80
3992 Asp Pro Tyr Tyr Ile Asn Lys Lys Thr Phe Ile Val Met Asn Lys Gly
3993      85      90      95
3995 Lys Ala Ile Ser Arg Phe Ser Ala Thr Ser Ala Leu Tyr Ile Leu Thr
3996      100      105      110
E--> 3998 Pro Leu Asn Pro Val Arg Lys Ile Ala Xaa Lys Ile Leu Val His Ser
3999      115      120      125
4001 Leu Phe Ser Met Leu Ile Met Cys Thr Ile Leu Thr Asn Cys Val Phe
4002 130      135      140
4004 Met Thr Leu Ser Asn Pro Asp Trp Thr Lys Asn Val Glu Tyr Thr
4005 145      150      155      160
4007 Phe Thr Gly Ile Tyr Thr Phe Glu Ser Leu Ile Lys Ile Leu Ala Arg
4008      165      170      175
4010 Gly Phe Cys Leu Glu Asp Phe Thr Phe Leu Arg Asp Pro Trp Asn Trp
4011      180      185      190
4013 Leu Asp Phe Ser Val Ile Val Met Ala Tyr Val Thr Glu Phe Val Ser
4014      195      200      205
4016 Leu Gly Asn Val Ser Ala Leu Arg Thr Phe Arg Val Leu Arg Ala Leu
4017 210      215      220
4019 Lys Thr Ile Ser Val Ile Pro Gly Leu Lys Thr Ile Val Gly Ala Leu
4020 225      230      235      240
4022 Ile Gln Ser Val Lys Lys Leu Ser Asp Val Met Ile Leu Thr Val Phe
4023      245      250      255
4025 Cys Leu Ser Val Phe Ala Leu Ile Gly Leu Gln Leu Phe Met Gly Asn
4026      260      265      270
4028 Leu Arg Asn Lys Cys Leu Gln Trp Pro Pro Ser Asp Ser Ala Phe Glu
4029      275      280      285
4031 Thr Asn Thr Thr Ser Tyr Phe Asn Gly Thr Met Asp Ser Asn Gly Thr
4032 290      295      300
4034 Phe Val Asn Val Thr Met Ser Thr Phe Asn Trp Lys Asp Tyr Ile Gly
4035 305      310      315      320
4037 Asp Asp Ser His Phe Tyr Val Leu Asp Gly Gln Lys Asp Pro Leu Leu
4038      325      330      335
4040 Cys Gly Asn Gly Ser Asp Ala Gly Gln Cys Pro Glu Gly Tyr Ile Cys
4041      340      345      350
4043 Val Lys Ala Gly Arg Asn Pro Asn Tyr Gly Tyr Thr Ser Phe Asp Thr
4044      355      360      365
4046 Phe Ser Trp Ala Phe Leu Ser Leu Phe Arg Leu Met Thr Gln Asp Tyr
4047 370      375      380
4049 Trp Glu Asn Leu Tyr Gln Leu Thr Leu Arg Ala Ala Gly Lys Thr Tyr
4050 385      390      395      400
4052 Met Ile Phe Phe Val Leu Val Ile Phe Leu Gly Ser Phe Tyr Leu Val
4053      405      410      415
4055 Asn Leu Ile Leu Ala Val Val Ala Met Ala Tyr Glu Gly Gln Asn Gln
4056      420      425      430
4058 Ala Thr Leu Glu Glu Ala Glu Gln Lys Glu Ala Glu Phe Gln Gln Met
4059      435      440      445

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/718,355C

DATE: 01/06/2003

TIME: 10:30:21

Input Set : A:\GOUD023US.APP

Output Set: N:\CRF4\01062003\I718355C.raw

```

4061 Leu Glu Gln Leu Lys Lys Gln Gln Glu Glu Ala Gln Ala Val Ala Ala
4062      450                      455                      460
4064 Ala Ser Ala Ala Ser Arg Asp Phe Ser Gly Ile Gly Gly Leu Gly Glu
4065 465                      470                      475                      480
4067 Leu Leu Glu Ser Ser Ser Glu Ala Ser Lys Leu Ser Ser Lys Ser Ala
4068                      485                      490                      495
4070 Lys Glu Trp Arg Asn Arg Arg Lys Lys Arg Arg Gln Arg Glu His Leu
4071                      500                      505                      510
4073 Glu Gly Asn Asn Lys Gly Glu Arg Asp Ser Phe Pro Lys Ser Glu Ser
4074                      515                      520                      525
4076 Glu Asp Ser Val Lys Arg Ser Ser Phe Leu Phe Ser Met Asp Gly Asn
4077      530                      535                      540
4079 Arg Leu Thr Ser Asp Lys Lys Phe Cys Ser Pro His Gln Ser Leu Leu
4080 545                      550                      555                      560
4082 Ser Ile Arg Gly Ser Leu Phe Ser Pro Arg Arg Asn Ser Lys Thr Ser
4083                      565                      570                      575
4085 Ile Phe Ser Phe Arg Gly Arg Ala Lys Asp Val Gly Ser Glu Asn Asp
4086                      580                      585                      590
4088 Phe Ala Asp Asp Glu His Ser Thr Phe Glu Asp Ser Glu Ser Arg Arg
4089                      595                      600                      605
4091 Asp Ser Leu Phe Val Pro His Arg His Gly Glu Arg Arg Asn Ser Asn
4092      610                      615                      620
4094 Gly Thr Thr Thr Glu Thr Glu Val Arg Lys Arg Arg Leu Ser Ser Tyr
4095 625                      630                      635                      640
4097 Gln Ile Ser Met Glu Met Leu Glu Asp Ser Ser Gly Arg Gln Arg Ala
4098                      645                      650                      655
4100 Val Ser Ile Ala Ser Ile Leu Thr Asn Thr Met Glu Glu Leu Glu Glu
4101                      660                      665                      670
4103 Ser Arg Gln Lys Cys Pro Pro Cys Trp Tyr Arg Phe Ala Asn Val Phe
4104                      675                      680                      685
4106 Leu Ile Trp Asp Cys Cys Asp Ala Trp Leu Lys Val Lys His Leu Val
4107      690                      695                      700
4109 Asn Leu Ile Val Met Asp Pro Phe Val Asp Leu Ala Ile Thr Ile Cys
4110 705                      710                      715                      720
4112 Ile Val Leu Asn Thr Leu Phe Met Ala Met Glu His Tyr Pro Met Thr
4113                      725                      730                      735
4115 Glu Gln Phe Ser Ser Val Leu Thr Val Gly Asn Leu Val Phe Thr Gly
4116                      740                      745                      750
4118 Ile Phe Thr Ala Glu Met Val Leu Lys Ile Ile Ala Met Asp Pro Tyr
4119                      755                      760                      765
4121 Tyr Tyr Phe Gln Glu Gly Trp Asn Ile Phe Asp Gly Ile Ile Val Ser
4122      770                      775                      780
4124 Leu Ser Leu Met Glu Leu Gly Leu Ser Asn Val Glu Gly Leu Ser Val
4125 785                      790                      795                      800
4127 Leu Arg Ser Phe Arg Leu Leu Arg Val Phe Lys Leu Ala Lys Ser Trp
4128                      805                      810                      815
4130 Pro Thr Leu Asn Met Leu Ile Lys Ile Ile Gly Asn Ser Val Gly Ala
4131                      820                      825                      830
4133 Leu Gly Asn Leu Thr Leu Val Leu Ala Ile Ile Val Phe Ile Phe Ala

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/718,355C

DATE: 01/06/2003

TIME: 10:30:21

Input Set : A:\GOUD023US.APP

Output Set: N:\CRF4\01062003\I718355C.raw

```

4134          835          840          845
4136 Val Val Gly Met Gln Leu Phe Gly Lys Ser Tyr Lys Glu Cys Val Cys
4137          850          855          860
4139 Lys Ile Asn Asp Asp Cys Thr Leu Pro Arg Trp His Met Asn Asp Phe
4140 865          870          875          880
4142 Phe His Ser Phe Leu Ile Val Phe Arg Val Leu Cys Gly Glu Trp Ile
4143          885          890          895
4145 Glu Thr Met Trp Asp Cys Met Glu Val Ala Gly Gln Thr Met Cys Leu
4146          900          905          910
4148 Ile Val Phe Met Leu Val Met Val Ile Gly Asn Leu Val Val Leu Asn
4149          915          920          925
4151 Leu Phe Leu Ala Leu Leu Leu Ser Ser Phe Ser Ser Asp Asn Leu Ala
4152          930          935          940
4154 Ala Thr Asp Asp Asp Asn Glu Met Asn Asn Leu Gln Ile Ala Val Gly
4155 945          950          955          960
4157 Arg Met Gln Lys Gly Ile Asp Tyr Val Lys Asn Lys Met Arg Glu Cys
4158          965          970          975
4160 Phe Gln Lys Ala Phe Phe Arg Lys Pro Lys Val Ile Glu Ile His Glu
4161          980          985          990
4163 Gly Asn Lys Ile Asp Ser Cys Met Ser Asn Asn Thr Gly Ile Glu Ile
4164          995          1000          1005
4166 Ser Lys Glu Leu Asn Tyr Leu Arg Asp Gly Asn Gly Thr Thr Ser Gly
4167          1010          1015          1020
4169 Val Gly Thr Gly Ser Ser Val Glu Lys Tyr Val Ile Asp Glu Asn Asp
4170 1025          1030          1035          1040
4172 Tyr Met Ser Phe Ile Asn Asn Pro Ser Leu Thr Val Thr Val Pro Ile
4173          1045          1050          1055
4175 Ala Val Gly Glu Ser Asp Phe Glu Asn Leu Asn Thr Glu Glu Phe Ser
4176          1060          1065          1070
4178 Ser Glu Ser Glu Leu Glu Glu Ser Lys Glu Lys Leu Asn Ala Thr Ser
4179          1075          1080          1085
4181 Ser Ser Glu Gly Ser Thr Val Asp Val Val Leu Pro Arg Glu Gly Glu
4182          1090          1095          1100
4184 Gln Ala Glu Thr Glu Pro Glu Glu Asp Leu Lys Pro Glu Ala Cys Phe
4185 1105          1110          1115          1120
4187 Thr Glu Gly Cys Ile Lys Lys Phe Pro Phe Cys Gln Val Ser Thr Glu
4188          1125          1130          1135
4190 Glu Gly Lys Gly Lys Ile Trp Trp Asn Leu Arg Lys Thr Cys Tyr Ser
4191          1140          1145          1150
4193 Ile Val Glu His Asn Trp Phe Glu Thr Phe Ile Val Phe Met Ile Leu
4194          1155          1160          1165
4196 Leu Ser Ser Gly Ala Leu Ala Phe Glu Asp Ile Tyr Ile Glu Gln Arg
4197          1170          1175          1180
4199 Lys Thr Ile Lys Thr Met Leu Glu Tyr Ala Asp Lys Val Phe Thr Tyr
4200 1185          1190          1195          1200
4202 Ile Phe Ile Leu Glu Met Leu Leu Lys Trp Val Ala Tyr Gly Phe Gln
4203          1205          1210          1215
4205 Thr Tyr Phe Thr Asn Ala Trp Cys Trp Leu Asp Phe Leu Ile Val Asp
4206          1220          1225          1230

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/718,355C

DATE: 01/06/2003

TIME: 10:30:21

Input Set : A:\GOUD023US.APP

Output Set: N:\CRF4\01062003\I718355C.raw

```

4208 Val Ser Leu Val Ser Leu Val Ala Asn Ala Leu Gly Tyr Ser Glu Leu
4209      1235      1240      1245
4211 Gly Ala Ile Lys Ser Leu Arg Thr Leu Arg Ala Leu Arg Pro Leu Arg
4212      1250      1255      1260
4214 Ala Leu Ser Arg Phe Glu Gly Met Arg Val Val Val Asn Ala Leu Val
4215 1265      1270      1275      1280
4217 Gly Ala Ile Pro Ser Ile Met Asn Val Leu Leu Val Cys Leu Ile Phe
4218      1285      1290      1295
4220 Trp Leu Ile Phe Ser Ile Met Gly Val Asn Leu Phe Ala Gly Lys Phe
4221      1300      1305      1310
4223 Tyr His Cys Val Asn Met Thr Thr Gly Asn Met Phe Asp Ile Ser Asp
4224      1315      1320      1325
4226 Val Asn Asn Leu Ser Asp Cys Gln Ala Leu Gly Lys Gln Ala Arg Trp
4227      1330      1335      1340
4229 Lys Asn Val Lys Val Asn Phe Asp Asn Val Gly Ala Gly Tyr Leu Ala
4230 1345      1350      1355      1360
4232 Leu Leu Gln Val Ala Thr Phe Lys Gly Trp Met Asp Ile Met Tyr Ala
4233      1365      1370      1375
4235 Ala Val Asp Ser Arg Asp Val Lys Leu Gln Pro Val Tyr Glu Glu Asn
4236      1380      1385      1390
4238 Leu Tyr Met Tyr Leu Tyr Phe Val Ile Phe Ile Ile Phe Gly Ser Phe
4239      1395      1400      1405
4241 Phe Thr Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn Gln
4242      1410      1415      1420
4244 Gln Lys Lys Lys Phe Gly Gly Gln Asp Ile Phe Met Thr Glu Glu Gln
4245 1425      1430      1435      1440
4247 Lys Lys Tyr Tyr Asn Ala Met Lys Lys Leu Gly Ser Lys Lys Pro Gln
4248      1445      1450      1455
4250 Lys Pro Ile Pro Arg Pro Ala Asn Lys Phe Gln Gly Met Val Phe Asp
4251      1460      1465      1470
4253 Phe Val Thr Arg Gln Val Phe Asp Ile Ser Ile Met Ile Leu Ile Cys
4254      1475      1480      1485
4256 Leu Asn Met Val Thr Met Met Val Glu Thr Asp Asp Gln Gly Lys Tyr
4257      1490      1495      1500
4259 Met Thr Leu Val Leu Ser Arg Ile Asn Leu Val Phe Ile Val Leu Phe
4260 1505      1510      1515      1520
4262 Thr Gly Glu Phe Val Leu Lys Leu Val Ser Leu Arg His Tyr Tyr Phe
4263      1525      1530      1535
4265 Thr Ile Gly Trp Asn Ile Phe Asp Phe Val Val Val Ile Leu Ser Ile
4266      1540      1545      1550
4268 Val Gly Met Phe Leu Ala Glu Met Ile Glu Lys Tyr Phe Val Ser Pro
4269      1555      1560      1565
4271 Thr Leu Phe Arg Val Ile Arg Leu Ala Arg Ile Gly Arg Ile Leu Arg
4272      1570      1575      1580
4274 Leu Ile Lys Gly Ala Lys Gly Ile Arg Thr Leu Leu Phe Ala Leu Met
4275 1585      1590      1595      1600
4277 Met Ser Leu Pro Ala Leu Phe Asn Ile Gly Leu Leu Leu Phe Leu Val
4278      1605      1610      1615
4280 Met Phe Ile Tyr Ala Ile Phe Gly Met Ser Asn Phe Ala Tyr Val Lys

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/718,355C

DATE: 01/06/2003

TIME: 10:30:21

Input Set : A:\GOUD023US.APP

Output Set: N:\CRF4\01062003\I718355C.raw

```

4281          1620          1625          1630
4283 Lys Glu Ala Gly Ile Asp Asp Met Phe Asn Phe Glu Thr Phe Gly Asn
4284          1635          1640          1645
4286 Ser Met Ile Cys Leu Phe Gln Ile Thr Thr Ser Ala Gly Trp Asp Gly
4287          1650          1655          1660
4289 Leu Leu Ala Pro Ile Leu Asn Ser Ala Pro Pro Asp Cys Asp Pro Asp
4290 1665          1670          1675          1680
4292 Thr Ile His Pro Gly Ser Ser Val Lys Gly Asp Cys Gly Asn Pro Ser
4293          1685          1690          1695
4295 Val Gly Ile Phe Phe Phe Val Ser Tyr Ile Ile Ile Ser Phe Leu Val
4296          1700          1705          1710
4298 Val Val Asn Ser Tyr Ile Ala Val Ile Leu Glu Asn Phe Ser Val Ala
4299          1715          1720          1725
4301 Thr Glu Glu Ser Ala Glu Pro Leu Ser Glu Asp Asp Phe Glu Met Phe
4302          1730          1735          1740
4304 Tyr Glu Val Trp Glu Lys Phe Asp Pro Asp Ala Thr Gln Phe Ile Glu
4305 1745          1750          1755          1760
4307 Phe Ser Lys Leu Ser Asp Phe Ala Ala Ala Leu Asp Pro Pro Leu Leu
4308          1765          1770          1775
4310 Ile Ala Lys Pro Asn Lys Val Gln Leu Ile Ala Met Asp Leu Pro Met
4311          1780          1785          1790
4313 Val Ser Gly Asp Arg Ile His Cys Leu Asp Ile Leu Phe Ala Phe Thr
4314          1795          1800          1805
4316 Lys Arg Val Leu Gly Glu Ser Gly Glu Met Asp Ala Leu Arg Ile Gln
4317          1810          1815          1820
4319 Met Glu Asp Arg Phe Met Ala Ser Asn Pro Ser Lys Val Ser Tyr Glu
4320 1825          1830          1835          1840
4322 Pro Ile Thr Thr Thr Leu Lys Arg Lys Gln Glu Glu Val Ser Ala Ala
4323          1845          1850          1855
4325 Ile Ile Gln Arg Asn Phe Arg Cys Tyr Leu Leu Lys Gln Arg Leu Lys
4326          1860          1865          1870
4328 Asn Ile Ser Ser Asn Tyr Asn Lys Glu Ala Ile Lys Gly Arg Ile Asp
4329          1875          1880          1885
4331 Leu Pro Ile Lys Gln Asp Met Ile Ile Asp Lys Leu Asn Gly Asn Ser
4332          1890          1895          1900
4334 Thr Pro Glu Lys Thr Asp Gly Ser Ser Ser Thr Thr Ser Pro Pro Ser
4335 1905          1910          1915          1920
4337 Tyr Asp Ser Val Thr Lys Pro Asp Lys Glu Lys Phe Glu Lys Asp Lys
4338          1925          1930          1935
4340 Pro Glu Lys Glu Ser Lys Gly Lys Glu Val Arg Glu Asn Gln Lys
4341          1940          1945          1950
4630 <210> SEQ ID NO: 84
4631 <211> LENGTH: 566
4632 <212> TYPE: DNA
4633 <213> ORGANISM: Homo sapiens
4635 <400> SEQUENCE: 84
4636 gaattctctt aaaggtacta cctgtgatac tttttttaa aaaaaactgt ttataactta 60
4637 gcaataattc aatattttat tcttgaaatt cttacctgga aaattgcatg tagcatgatt 120
4638 tgcaaagaaa tgctatgtgg tgttgattta cttattggga agagtgggtt gagccatcag 180

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RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/718,355C

DATE: 01/06/2003

TIME: 10:30:21

Input Set : A:\GOUD023US.APP

Output Set: N:\CRF4\01062003\I718355C.raw

```

4639 tatttggttt gcagggcacc accactgaaa cggaagtcag aaagagaagg ttaagctctt 240
4640 accagatttc aatggagatg ctggaggatt cctctggaag gcaaagagcc gtgagcatag 300
4641 ccagcattct gaccaacaca atggaaggta agagcaggtc atggaacagc caactttctg 360
4642 tgattatgtg ctttgtgaac tattccttct ttcatagaa ttactgaagt ctgttaccga 420
E--> 4643 gatogaacta tatattagac ctaagaatgt gatatatggt gtacattatc acattgntta 480
4644 caaaactaat attggcctta ttctttttga cttgggtcct taccttactt gcagagtgat 540
4645 atttcaacac ttgatattat atcaat                                     566

```

VARIABLE LOCATION SUMMARY

PATENT APPLICATION: US/09/718,355C

DATE: 01/06/2003

TIME: 10:30:26

Input Set : A:\GOUD023US.APP

Output Set: N:\CRF4\01062003\I718355C.raw

Use of n's or Xaa's (NEW RULES):

Use of n's and/or Xaa's have been detected in the Sequence Listing.

Use of <220> to <223> is MANDATORY if n's or Xaa's are present.

in <220> to <223> section, please explain location of n or Xaa, and which residue n or Xaa represents.

Seq#:23; N Pos. 393,415,454,513

Seq#:29; N Pos. 43

Seq#:41; N Pos. 293

Seq#:42; N Pos. 133

Seq#:44; N Pos. 229

Seq#:48; N Pos. 164

Seq#:55; N Pos. 90,378,379,380,381,382,383,384,385,386

Seq#:67; Xaa Pos. 122

Seq#:68; Xaa Pos. 122

Seq#:84; N Pos. 477

VERIFICATION SUMMARYPATENT APPLICATION: **US/09/718,355C**

DATE: 01/06/2003

TIME: 10:30:26

Input Set : **A:\GOUD023US.APP**Output Set: **N:\CRF4\01062003\I718355C.raw**

L:1439 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:23
M:340 Repeated in SeqNo=23
L:1538 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:29
L:2800 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:41
L:2813 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:42
L:2844 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:44
L:2919 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:48
L:3060 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:55
M:340 Repeated in SeqNo=55
L:3625 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:67
L:3998 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:68
L:4643 M:340 E: (46) "n" or "Xaa" used: Feature required, for SEQ ID#:84